

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

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PCT

NOTIFICATION OF TRANSMITTAL OF
THE INTERNATIONAL PRELIMINARY
EXAMINATION REPORT
(PCT Rule 71.1)

Date of mailing
(day/month/year) 28.06.2001

Applicant's or agent's file reference
HL73026/001/mja

IMPORTANT NOTIFICATION

International application No.
PCT/GB00/03171

International filing date (day/month/year)
16/08/2000

Priority date (day/month/year)
16/08/1999

Applicant
FLYING NULL LIMITED et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary examination report and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.

4. REMINDER

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary examination report. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

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PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

| | | | |
|---|--|--|---|
| Applicant's or agent's file reference HL73026/001/mja | | FOR FURTHER ACTION | See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416) |
| International application No. PCT/GB00/03171 | International filing date (day/month/year) 16/08/2000 | Priority date (day/month/year) 16/08/1999 | |
| International Patent Classification (IPC) or national classification and IPC G06K19/06 | | | |
| Applicant FLYING NULL LIMITED et al. | | | |
| <p>1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 4 sheets, including this cover sheet.</p> <p><input checked="" type="checkbox"/> This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).</p> <p>These annexes consist of a total of 5 sheets.</p> | | | |
| <p>3. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> I <input checked="" type="checkbox"/> Basis of the report II <input type="checkbox"/> Priority III <input type="checkbox"/> Non-establishment of opinion with regard to novelty, inventive step and industrial applicability IV <input type="checkbox"/> Lack of unity of invention V <input checked="" type="checkbox"/> Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement VI <input type="checkbox"/> Certain documents cited VII <input checked="" type="checkbox"/> Certain defects in the international application VIII <input type="checkbox"/> Certain observations on the international application | | | |
| Date of submission of the demand 21/02/2001 | | Date of completion of this report 28.06.2001 | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | | Authorized officer Harms, J Telephone No. +49 89 2399 2708 | |





INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/GB00/03171

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, pages:

1-14 as originally filed

Claims, No.:

1-23 as amended under Article 19

Drawings, sheets:

1/1 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

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EXAMINATION REPORT**

International application No. PCT/GB00/03171

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | |
|-------------------------------|------------------|
| Novelty (N) | Yes: Claims 1-23 |
| | No: Claims |
| Inventive step (IS) | Yes: Claims 1-23 |
| | No: Claims |
| Industrial applicability (IA) | Yes: Claims 1-23 |
| | No: Claims |

2. Citations and explanations
see separate sheet

VII. Certain defects in the international application

The following defects in the form or contents of the international application have been noted:
see separate sheet

Re.: Item V

The invention concerns an information carrier (claims 1 and 2) and an information coding method (claims 18 and 19), in particular the way in which the elements encoding the information are arranged on a substrate. Closest prior art is US-A-5 552 591 according to which the spaces between single-width bar code elements constitute integer multiples of a minimum space width. According to the claimed invention the spaces between the elements can be represented by $A + mG$, wherein m is an integer and A and G are mutually different fixed values. This is not suggested by the prior art and makes it possible individually to select the minimum separation (A) between two elements as eg. required by the reading method, and the gap increments (mG), so that greater density of data can be carried on a given information carrier size.

Dependent claims 3-17 and 20-23 concern preferred embodiments of the apparatuses or methods of claims 1, 2, 18 and 19 and therefore likewise meet the requirements of novelty and inventive step.

Re.: Item VII

The adopted two-part form of the independent claims is incorrect; as an example, all the features contained in numbered lines 3-12 of claim 1 are known, in combination, from US-A-5 552 591 and would hence belong in the preamble of the claim, Rule 6.3(b) PCT.

The summary of the invention on description pages 2-4 is not in conformity with the amended set of claims, Article 6 PCT and Rule 5.1(a)(iii) PCT.

US-A-5 552 591 is not acknowledged in the description, contrary to Rule 5.1 (a)(ii) PCT.

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CLAIMS:

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1. An information carrier comprising a plurality of detectable elements supported by, or incorporated in a substrate, the elements being spaced apart from one another such that the series of spaces between the elements encodes the information carrier, characterised in that each of the spaces can be represented by $A + mG$, wherein A is a first fixed value, G is a second fixed value and m is an integer (which may be zero) the values of which are derived from the integers of a predetermined mathematical sequence, and wherein the value of A is different to the value of G.
2. An information carrier comprising a plurality of detectable elements supported by, or incorporated in a substrate, the elements being spaced apart from one another such that the series of spaces between the elements encodes the information carrier, characterised in that each of the spaces can be represented by $A + mG$, wherein A is a first fixed value, G is a second fixed value and m is an integer (which may be zero) the values of which are derived by means of a random number generator, and wherein the value of A is different to the value of G.
3. An information carrier as claimed in claim 1, wherein the values of the integer m are selected to be integers derived from the output of a de Bruijn sequence.
4. An information carrier as claimed in claim 1 or 3, wherein the integers m are selected to be integers derived from the output of a binary pseudo-random sequence generator.

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5. An information carrier as claimed in any preceding claim, wherein said fixed values A and G are units of length.

5 6. An information carrier as claimed in any preceding claim, wherein said fixed values A and G are angles.

10 7. An information carrier as claimed in any preceding claim, wherein the spacing between adjacent detectable elements is measured from the midpoint of one element to the midpoint of the adjacent element.

15 8. An information carrier as claimed in any preceding claim, wherein said detectable elements are magnetically active elements.

20 9. An information carrier as claimed in claim 8, wherein said magnetically active detectable elements comprise high permeability, low coercivity material having an easy axis of magnetisation.

25 10. An information carrier as claimed in any preceding claim, wherein said detectable elements are formed of an optically detectable material.

30 11. An information carrier as claimed in claim 8 or 9 wherein said the magnetic properties of each of the magnetic elements serves to encode the information carrier.

35 12. An information carrier as claimed in any preceding claim, wherein the geometric properties of the elements is varied such that the relative dimensions of the elements also serves to encode information.

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13. An information carrier as claimed in claim 11 or 12 wherein the magnetic or geometric properties of at least one of the elements is or are known, thereby acting as a reference element, with respect to which, the magnetic or geometric properties of the other detectable elements can be determined when decoding the information carrier

14. An information carrier as claimed in any one of claims 11, 12 or 13, wherein the length of the magnetic elements is varied such that the relative lengths of said magnetic elements also serves to encode information.

15. An information carrier as claimed in any preceding claim, wherein said mathematical sequence is a recurring sequence.

16. An information carrier as claimed in any preceding claim, wherein said substrate comprises a linear strip.

17. An information carrier as claimed in any preceding claim, wherein the series of spaces between the elements are chosen such that the encoded information can be determined irrespective of the direction in which the information carrier is read.

18. An information coding method utilising a plurality of detectable elements supported by, or incorporated in a substrate, the elements being spaced apart from one another such that the series of spaces between the elements encodes the information carrier, characterised in that each of the spaces can be represented by $A + mG$, wherein A is a first fixed value, G is a second fixed value and m is an integer (which may be zero) the values of which are derived from the integers of a

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predetermined mathematical sequence, and wherein the value of A is different to the value of G.

5 19. An information coding method utilising a plurality of detectable elements supported by, or incorporated in a substrate, the elements being spaced apart from one another such that the series of spaces between the elements encodes the information carrier, characterised in that each of the spaces can be represented by $A + mG$, wherein A is a first fixed value, G is a second fixed value and m is an integer (which may be zero) the values of which are derived by means of a random number generator, and wherein the value of A is different to the value of G.

15 20. An information coding method as claimed in claim 18 or 19, wherein the method utilises an information carrier as claimed in any one of claims 3 to 17.

20 21. An information coding method as claimed in any one of claims 18, 19 or 20, wherein the encoded information is determined by detecting the spacing between each pair of adjacent elements and expressing the spacings as a sequence which maintains the order of spacings on the tag, but commences with the spacing of greatest magnitude, and wherein if there are two or more spacings equal to the greatest magnitude, the starting value of the sequence is selected such that the sequence, if read as a number, would have the highest possible value.

25 22. An information coding method as claimed in any one of claims 18, 19 or 20 wherein the encoded information is determined by detecting the spacing between adjacent elements when considered in turn along a predetermined path.

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23. An information coding method as claimed in claims 18, 19 or 20, wherein the encoded information is determined by the following steps:

5 i) determining the sequence of spacings between adjacent elements when considered in turn along a first predetermined path;

10 ii) determining the sequence of spacings between adjacent elements when considered in turn along a second predetermined path which is opposite in direction to the first predetermined path;

15 iii) selecting one of the sequences of spacings by performing an iterative comparison of successive spacings in each of the paths, the selected sequence being the first one which generates a larger spacing than the other sequence during said iterative comparison; and

iv) decoding the selected sequence to determine the encoded information.

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